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**Conference Report on H.R. 2272 – The 21st Century Competitiveness Act of 2007**

**Executive Summary**

H.R. 2272 is aimed at achieving goals established in the President's American Competitiveness Initiative (ACI), which was designed to increase investments in research and development, strengthen education, and encourage entrepreneurship. The House passed H.R. 2272 by voice vote in the House of Representatives on May 21, 2007. The Senate struck the House language in an amendment in the nature of a substitute, which passed by unanimous consent in the Senate on July 19, 2007. The Conference met and agreed to report the bill on July 31, 2007.

While there is widespread bipartisan support for the ACI and education and innovation in science, technology, education, and mathematics (STEM), some House Republicans had concerns with this Conference Report. Of primary concern is that the Conference Report, at a cost of $43.3 billion, costs $20 billion more than the House-passed version. Much of the increased cost stems from expansions of programs that were planned to double in size (and levels of federal spending) within 10 years to an even faster rate of growth.

Republicans also expressed concerns that the Conference Report omitted language that had passed in the House to require the Department of Energy to prioritize grants that promote coal to liquids and nuclear reprocessing research. Republicans also took issue with newly established education programs within the Department of Energy that seem to reach beyond the Department's area of expertise and mission, possibly to the detriment of the new programs' success. The Advanced Research Projects Agency for Energy (ARPA-E) program, which is designed to encourage the development of energy technologies, drew criticism from some Republicans who expressed that this would establish a new and unnecessary bureaucracy and that funds in the bill could be better spent in other areas.

**Floor Situation**

The Conference Report on H.R. 2272 is being considered on the floor under a structured rule. The rule:

- Waives all points of order against the conference report and its consideration.

The House of Representatives passed H.R. 2272, which was introduced by Representative Bart Gordon (D-TN), on May 21, 2007 by voice vote. The Senate passed

H.R. 2272, as amended, by unanimous consent on July 19, 2007 and appointed conferees that same day. The House passed a Motion to Instruct Conferees on July 31, 2007 by a vote of 258 - 167 (Roll no. 770), and appointed conferees that same day.

H.R. 2272 is expected to be considered on the floor on August 2, 2007.

**Summary**

**Title I – Office of Science and Technology; Policy; Government-wide Science**

**National Science and Technology Summit:** The Conference Report requires the President to convene a National Health and Technology Summit to examine the health and direction of the United States science, technology, engineering, and mathematics enterprises (STEM). This summit would be comprised of representatives from industry, small businesses, labor, academia, State governments, Federal research and development agencies, and energy policy groups concerned with STEM, and is directed to report back to Congress 90 days after the conclusion of the summit.

**Study on Barriers to Innovation:** The Conference Report authorizes $1 million for the Director of the Office of Science and Technology Policy and the National Academy of Sciences to conduct a study to identify available methods to remove barriers to business innovation in the areas of STEM. Additionally, the study will evaluate state academic assessment tests in mathematics, science, and reading and the number of students entering institutions of higher learning.

**President's Council on Innovation and Competitiveness:** The Conference Report requires the President to establish a council to monitor the implementation of public laws that promote innovation in STEM related areas. The Council will be responsible for assessing the country's strengths and weaknesses in research and development and measuring the progress of the federal government in improving conditions for innovation.

**Coordination of National Research Infrastructure:** The Conference Report requires the Director of the Office of Science and Technology to identify and prioritize deficiencies in United States research facilities. The prioritization will be based on the research needs in areas relevant to specific mission requirements of federal agencies. The Director is required to submit a report to Congress and the President annually detailing the deficiencies and a list of projects and budget proposals on what areas are in need of improvement.

**Title II – National Aeronautics and Space Administration (NASA)**

**NASA Report to Congress:** The Conference Report requires the Administrator of NASA to submit to Congress and the President, a report that details NASA's efforts in the fields of science, technology, engineering, and math. This report will provide details on each program including the programs' cost and the number of students served by each program.

**International Space Station:** The Conference Report encourages NASA to design and implement additional research programs that can utilize the International Space Station.

## Title III – National Institute of Standards and Technology

**National Institute of Standards and Technology (NIST):** The Conference Report authorizes $2.65 billion over FY2008 – FY2010 for the NIST. This includes $1.63 billion for laboratory activities over the next three years.

**Technology Innovation Program (TIP):** In the Conference Report the Advanced Technology Program (ATP) is retired and replaced with a new program entitled the Technology Innovation Program (TIP), which is designed to support and promote innovation in the U.S. "through high-risk, high-reward research in areas of critical national need." The report provides an authorization of $100 million in FY2008 that steadily increases annually up to $140.5 million in FY2010. The program is based on competitive grants or contracts awarded to small and medium-sized companies which may be up to $3 million over 3 years for a single company or up to $9 million over 5 years for a joint venture.

**Manufacturing Extension Partnership (MEP):** The report funds the MEP program at $110 million in FY2008, $122 million in FY2009 and $131.8 million in FY2010, a funding plan that anticipates that MEP will double in size in ten years. The MEP program offers competitive grants whose costs are shared up to 50% with the federal government, and the program is designed to solve new or emerging manufacturing problems.

## Title IV – Ocean and Atmospheric Programs

**National Oceanic and Atmospheric Administration (NOAA) R&D program:** The Conference Report requires NOAA to establish a coordinated ocean, Great Lakes, coastal and atmospheric research, and development program.

## Title V – Department of Energy

**New Position Created for Education Programs:** The Secretary of Energy is directed to create the position of the Director of Science, Engineering, and

Mathematics Education who will have responsibility for education programs in these areas throughout the Department of Energy.

**Grant Pilot Program:** A pilot program is established and authorized to offer grants of up to $2 million per year, for up to three years for states to expand specialty secondary schools that provide math, science, technology, and engineering education to improve the academic achievement of students in these fields.

**Centers of Excellence:** The Secretary of Education is required to establish Centers of Excellence in Science, Technology, Engineering, and Math (STEM), which are to be located in public secondary schools with a high concentration of low-income individuals. At least one center is to be created for each region served by the Department of Energy's 17 national laboratories, and the Center locations would be chosen through an open, competitive process.

**Note: Some Republicans have concerns with this provision questioning the Department of Energy's role in establishing school-based programs that expand the Department's mission into educational ventures that the Department may not have the requisite expertise for. Additionally, there were concerns that the program should not be limited to schools with a high concentration of low-income individuals.*

**Advanced Research Projects Agency for Energy (ARPA-E):** The conference report establishes this new agency at the Department of Energy which is authorized to be funded at $300 million in FY2008 and such sums as are necessary in FY2009 and FY2010. The program is designed to fund the development of energy technologies that can be produced within the United States, reduce energy-related emissions, and improve energy efficiency. ARPA-E would be headed by a director chosen by the President and subject to Senate approval. The Director will be allowed to hire 70 to 120 scientific and engineering personnel without regard to civil service laws. ARPA-E is modeled after the Defense Advanced Projects Research Agency (DARPA). DARPA was founded in 1958 by an act of Congress (PL 85-325) to focus on advancing military capabilities and our quest to enter space.

**Note: Some Republicans expressed concerns that this program would create an unnecessary bureaucracy at the Department of Energy that the Department does not want and does not support and that by funding this program, important funds are diverted from other priorities of the American Competitiveness Initiative.*

## Title VI – Education

**Grants for Teaching Certificates along with Baccalaureate Degrees in STEM or Foreign Language:** The Conference Report authorizes $151.2 million for FY2008 and such sums as are necessary for FY2009 and FY2010 for a

competitive grant program to provide funds to institutions of higher learning to offer baccalaureate degrees in science, technology, engineering, math, or a critical foreign language along with teacher certification. The grants are available for up to five years, and recipients must match an amount equal to at least 50% of the grant amount from a non-federal source. The Department is directed to give priority to institutions whose primary focus is on placing participating students in low-income areas.

**Grants for Master's Degrees in STEM Fields:** The Conference Report authorizes $125 million for FY2008 and such sums as are necessary for FY2009 and FY2010 for a competitive grant program to provide funds to institutions of higher learning to offer 1) 2 or 3 year part-time master's degrees in science, technology, engineering, math, or a critical foreign language for teachers or 2) 1 year master's degree programs for professionals in STEM fields or a critical foreign language. The grants are available for up to five years, and recipients must match an amount equal to at least 50% of the grant amount from a non-federal source. The Department is directed to give priority to institutions whose primary focus is on placing participating students in low-income areas.

**Advanced Placement and International Baccalaureate Programs:** The Conference Report authorizes $75 million for FY2008 and such sums as are necessary for FY2009 and FY2010 to increase the number of teachers serving (by 70,000) in Advanced Placement and International Baccalaureate programs as well as the number of low-income students participating and excelling (by 700,000) in such programs.

**Math Now for Elementary School and Middle School Students Program**: The Conference Report authorizes $95 million for FY 2008 and such sums as are necessary for FY 2009 and FY 2010 for a five year competitive grant program for state agencies to award grants to local educational agencies in order to: implement math programs, provide professional development and instructional activities for teachers (and administrators / staff when appropriate), and to conduct continuous progress monitoring. The legislation provides priority to projects that will implement statewide strategies for improving mathematics instruction and raising the mathematics achievement for students (particularly in grades 4 through 8).

**Foreign Language Partnership Program**: The Conference Report authorizes $28 million for FY 2009 and such sums as are necessary for FY 2009 and FY 2010 for a grant program to establish critical foreign language programs that will enable students to advance successfully with higher levels of proficiency in a critical foreign language. The grants shall be used to develop and implement programs for the development of curricula and instructional materials as well as recruitment of students. This grant program includes the following non-Federal matching requirement: 20% in the first year, 30% in the second year, 40% in the third year and 50% in the fourth and fifth year (the matching requirement may be provided in-kind and can be waived by the Secretary).

**Title VII – National Science Foundation**

This section provides a total of $22.06 billion in funding for FY2008 – FY2010.

**Note: Some Republicans expressed concerns with the cost of this section of the bill, stating "It is imperative that we do all that we can to stay ahead of the curve on this, and House Republicans fully support the President's goal of doubling funding of the National Science Foundation over a 10-year period. We did that in our House-passed bill. This report, however, puts us on a faster track and therefore* ***adds billions to the cost of the bill****."*

**Science, Technology, Engineering, and Mathematics Talent Expansion Program**: The Conference Report amends a current grant program in order to increase the number of students studying toward and completing degrees in science, technology, engineering, and mathematics. Additionally, this provision would create five centers that would develop undergraduate educational material, teaching methods for undergraduate courses, and methods to improve the professional development of professors and teaching assistants.

**Laboratory Science Pilot Program**: The Conference Report establishes a pilot program to award grants to institutions that have a 2-year or 4-year degree program in order to improve laboratories and instrumentation, including the purchase or rental of equipment, development of instructional programs, safety training, and design / implementation of hands-on laboratory experiences. The non-federal share of the cost of these grants are 60% and this program sunsets in FY 2010.

**Robert Noyce Scholarship Program:** This federal grant program provides grants to schools to recruit and train math and science teachers and to provide scholarships and stipends to individuals participating in the program. Individual *scholarships* are available at $10,000 a year and up and require the recipient to agree to complete a "service obligation" within 8 years of graduation for 2 years, as a math or science teacher at a school in a low-income area, for each full scholarship award received. *Stipends* are also available at $10,000 a year and up and require a service obligation to be completed within 4 years of graduation for 2 years, as a math or science teacher at a school in a low-income area. *Fellowships* are also available at $10,000 a year and up and are available to math and science teachers and professionals to further develop their skills as teachers, and requires the fellows to take a leadership role during their fellowship and serve as a mentor or master teacher developing curricula and professional development activities. Fellows are also charged with a service obligation of serving either 4 or 5 years within 6 or 7 years of graduation (depending on the type of fellowship grant) as a math or science teacher at a school in a low-income area. Fellows are subject to a matching requirement for the grant they receive, and the match has to come

from a non-federal source in the amount of at least 50% of the amount of the grant.

**Note: Some Republicans had concerns that during the Conference on this bill, the House-passed provision was omitted that allowed grant recipients more choice in where they fulfill their service requirement, providing that **if** they chose to fulfill their service at a school in a low-income area then their years of service would be reduced. The Conference Report language requires **all** grant recipients to teach at low-income schools.*

**Background**

The President requested $5.9 billion in his FY 2007 budget to increase investments in research and development, strengthening education, and encouraging entrepreneurship. This program was entitled the "American Competitiveness Initiative" (ACI).

The House has passed several pieces of legislation that were aimed towards accomplishing portions of the ACI. The most recent was H.R. 2272 the "21st Century Competitiveness Act of 2007" which was introduced by Representative Bart Gordon (D-TN) and passed the House on May 21, 2007 by voice vote.

This legislation combined several bills that had previously passed in the House. The Senate amended H.R. 2272 in the nature of a substitute and passed the bill, by unanimous consent on July 19, 2007. The House disagreed with the Senate language and the Senate and the House agreed to go to Conference on H.R. 2272 on July 31, 2007. The Conference Report was agreed to on that same day.

During the Conference process, $20 billion in additional funding was added, spread over several ACI programs. There is a total of $17 billion spent for Department of Energy (DOE) provisions, $22 billion for the National Science Foundation and sets aside $1 million for the Office of Science and Technology. These additions bring the total cost of this bill to $43.3 billion.

**Note: The Republicans on the Committees of jurisdiction generally support the President's ACI program, but some expressed concerns at the significantly increased levels of funding in the Conference Report. Some Republicans expressed concern regarding the ARPA-E program, which some Republicans on the Science Committee believe adds another layer of bureaucracy and is duplicative of existing DOE goals. Lastly, some Republicans take issue with the National Academy of Sciences (NAS) funding and re-prioritizing of research. This legislation puts behavioral science on par with the hard sciences (STEM), while the goal of the legislation is to advance STEM-related practices. This allows the NAS to divert funding from STEM to behavioral sciences.*

**Cost**
At the time of publication the Congressional Budget Office (CBO) did not have a score available for this legislation.

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